

Appl. No. 10/669,970
Amdt. Dated January 6, 2006
Reply to Office Action of October 6, 2005

• • REMARKS/ ARGUMENTS • •

The Official Action of October 6, 2005 has been thoroughly studied. Accordingly, the following remarks are believed to be sufficient to place the application into condition for allowance.

By the present amendment the specification has been amended as requested by the Examiner to correct unclear language.

Also by the present amendment, claim 1 has been changed to recite ethylene-methyl acrylate copolymer rubber.

Entry of the changes to the specification and claims are respectfully requested.

On page 2 of the Office Action the Examiner requested applicants to revise the specification to comply with 35 U.S.C. §112, first paragraph. Under this request the Examiner noted several instances in which the language of the specification was deemed by the Examiner to be unclear.

In response to the Examiner's request, applicants have reviewed the specification and presented appropriate changes to the specification herein.

Also on page 2 of the Office Action the Examiner rejected claim 1 under 35 U.S.C. §112, first paragraph.

Under this rejection the Examiner noted that claim recited "ethylene-methyl copolymer rubber," while the specification enabled "ethylene-methyl acrylate copolymer rubber."

Claim 1 has been amended to recite "ethylene-methyl acrylate copolymer rubber."

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Claim 1-10 are pending in this application.

Claims 1-10 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Japanese reference No. JP 2003-183443 to Abe et al. in view of U.S. Patent Application Publication No. 2003/0077465 to Boudouris et al. The Examiner notes that U.S. Patent No. 6,870,002 to Abe et al. is and English language equivalent to JP 2003-183443 and will be used for translation purposes.

The Examiner has relied upon Abe et al. as teaching:

...a rubber composition, which comprises 100 parts by weight of a rubber mixture consisting of 70-95 wt.% of solid rubber and 30-5 wt.% of liquid rubber reactive on the solid rubber, and 450-1,000 parts by weight of magnetic powder. As the solid rubber, nitrile rubber (NBR), acrylic rubber (ACM), ethyl acrylate-ethylene copolymer rubber (AEM), ethylene-propylene copolymer rubber (EPDM), fluororubber (FKM), etc, may be used, according to the desired application.

The Examiner takes the position that:

Since applicant's ethylene methyl acrylate rubber differs from ethylene ethyl acrylate rubber of the JP reference only in that it is the next adjacent homologue, the use of the former would have been obvious to one of ordinary skill in the art at the time of applicant's invention

The Examiner will note that the inventive entity of JP 2003-183443 and U.S. Patent No. 6,870,002 are the same as the inventive entity of the present application.

Accordingly, the present inventors are very familiar with these prior art references and can distinguish the present invention over these reference as follows:

Abe et al. discloses that:

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The liquid rubber reactive on the solid rubber is a liquid rubber having the same structure as or similar to that of the solid rubber and being cocross-linkable with the same vulcanizing agent as for the solid rubber. (See column 1, lines 62-65).

The actual examples that Abe et al. discloses are "liquid NBR, liquid EPDM, liquid FKM, etc. can be used, dependent upon the selected solid rubber" (See column 1, lines 65-67).

Liquid AEM is not described in Abe et al.

Accordingly, it is submitted that there is no description in Abe et al. that uses only AEM as a solid rubber component and a liquid rubber component according to the present invention.

It is further pointed out that in Abe et al. that the working examples only involve the use of NBR

In Abe et al.'s comparative Example 2 in a rubber composition containing 800 parts by weight of Sr ferrite on the basis of 100 parts by weight of solid NBR is disclosed. The resulting sulfur-vulcanized molding product of the composition shows good hardness changes after heating at 120°C for 70 hours.

In contrast To Abe et al., the molded products of the present invention, which are obtained by selecting ethylene-methyl acrylate copolymer as a solid rubber (that is exemplified in Abe et al.) and ethylene-methyl acrylate copolymer as a liquid rubber (not taught by Abe et al.), and by curing the rubber by amine vulcanization, are found to have excellent heat resistance under such a high temperature situation at 150°C for 70 hours or 175°C for 70 hours.

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Because such results cannot be realized when NBR is used (according to the working examples in Abe et al.), it is submitted that applicants' present invention clearly involves unexpected results over the prior art.

It is further noted that the composition of the present invention has excellent properties such as water resistance and saline water resistance, which can not be achieved in the case which NBR is used as a rubber. This allows the composition of the present invention to be used for produce molded products that are useful as rubber magnets for sensors (encoders for detecting revolution of crank and cam shafts) for driving systems around or near engines where heat resistance at high temperatures of 130 - 170°C are common (NBR can not meet such a requirement) or rubber magnets for wheel speed sensors that are exposed to harsh, wet and muddy environments.

Although Abe et al. mentions AEM as one of the solid rubbers, Abe et al. is completely silent as to the results that can be achieved according to the present invention.

Accordingly, it is submitted that the present invention involves unexpected results over the teachings of Abe et al. so that Abe et al. cannot render the present invention obvious under 35 U.S.C. §103.

The Examiner has relied upon Boudouris et al. as disclosing compositions that comprise magnetic materials such as ferrites, rare earth-cobalt magnets of one or more of the rare earth elements such as Sm or Pr, yttrium (Y), lanthanum (La), cerium (Ce), or other magnetic materials including, for instance, manganese-bismuth and manganese-aluminum.

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The Examiner further relies upon Boudouris et al. as documenting "that ethylene methyl acrylates and ferrites are conventionally used in rubber compositions having magnetic properties.

In combining the teachings of Abe et al. and Boudouris et al. the Examiner take the position that:

The use of these compositions [of Boudouris et al.] in the JP invention would have been obvious to one of ordinary skill in the art at the time of applicant's invention

Boudouris et al. describes a composition in which magnetic filler is provided in a high mixing proportion in a thermoplastic elastomer. Boudouris et al. teaches that rubber can be used instead of the thermoplastic elastomer. Ethylene methyl acrylate is listed as an example.

Boudouris et al. fails to provide any description as to the excellent properties that can be achieved by the use of ethylene-methyl acrylate copolymer rubber.

In this regard, it is noted that Boudouris et al. is directed to "methods and compositions for making magnetic, printable assemblies that will self-adhere to a magnetically attracted surface.

In paragraph [0004] Boudouris et al. teaches:

A popular application of such materials is thin, flat magnets having on their outer surface a decorative pattern and/or promotional information, including advertisements in direct mailings, newspaper inserts, and so forth, box toppers, coupons, business cards, calendars, greeting cards, postcards, and so forth.

In paragraph [0005] Boudouris et al. teaches:

These magnetic pieces may then be placed on a magnetically attracted surface such as a refrigerator, file cabinet, or other surface where they may be used as reminders and are often used to hold sheets of paper such as notes, recipes, lists, children's artwork, reminders, and so on.

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Clearly Boudouris et al. is unrelated to the field of encoders and speed sensors so that Boudouris et al. does not overcome or cure the fact that applicants' compositions produce unexpected results as compared to Abe et al.

Based upon the above distinctions between the prior art relied upon by the Examiner and the present invention, and the overall teachings of prior art, properly considered as a whole, it is respectfully submitted that the Examiner cannot rely upon the prior art as required under 35 U.S.C. §103 to establish a *prima facie* case of obviousness of applicants' claimed invention.

It is, therefore, submitted that any reliance upon prior art would be improper inasmuch as the prior art does not remotely anticipate, teach, suggest or render obvious the present invention.

It is submitted that the claims, as now amended, and the discussion contained herein clearly show that the claimed invention is novel and neither anticipated nor obvious over the teachings of the prior art and the outstanding rejection of the claims should hence be withdrawn.

Therefore, reconsideration and withdrawal of the outstanding rejection of the claims and an early allowance of the claims is believed to be in order.

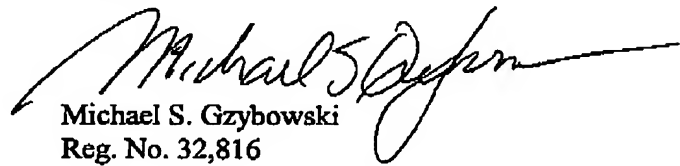
It is believed that the above represents a complete response to the Official Action and reconsideration is requested.

If upon consideration of the above, the Examiner should feel that there remains outstanding issues in the present application that could be resolved, the Examiner is invited to contact applicants' patent counsel at the telephone number given below to discuss such issues.

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To the extent necessary, a petition for an extension of time under 37 CFR §1.136 is hereby made. Please charge the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 12-2136 and please credit any excess fees to such deposit account.

Respectfully submitted,



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